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STANDARDIZATION *and* INSPECTION *of* FRESH FRUITS *and* VEGETABLES



UNITED STATES DEPARTMENT OF AGRICULTURE

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STANDARDIZATION AND INSPECTION OF FRESH FRUITS AND VEGETABLES

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INTRODUCTION

Standardization and inspection of fresh fruits and vegetables have made great strides in the past three decades. Prior to World War I, U. S. standards and Government inspection had not yet materialized and the stage was just being set for the unusual developments that were to follow. Today, most of nearly a million cars of fresh fruits and vegetables shipped annually by rail to city markets are bought and sold on the basis of official standards, mostly Federal, and more than half of them are inspected and certified for grade by Federal-State inspectors at shipping points.

A considerable part of the shipments by motortruck are also inspected. Federal-State inspectors also inspect a large volume of raw products delivered to processing plants for processing. In the receiving markets Federal inspectors also inspect annually in the neighborhood of 30,000 cars of these commodities, besides a large volume of supplies purchased by Government agencies.

The packing of fruits and vegetables in accordance with the requirements of official standards is the first step required for orderly marketing and efficient buying and selling (fig. 1). They furnish the yardstick for measuring variations in quality, and their use has made possible a basis for satisfactory long-distance dealing.

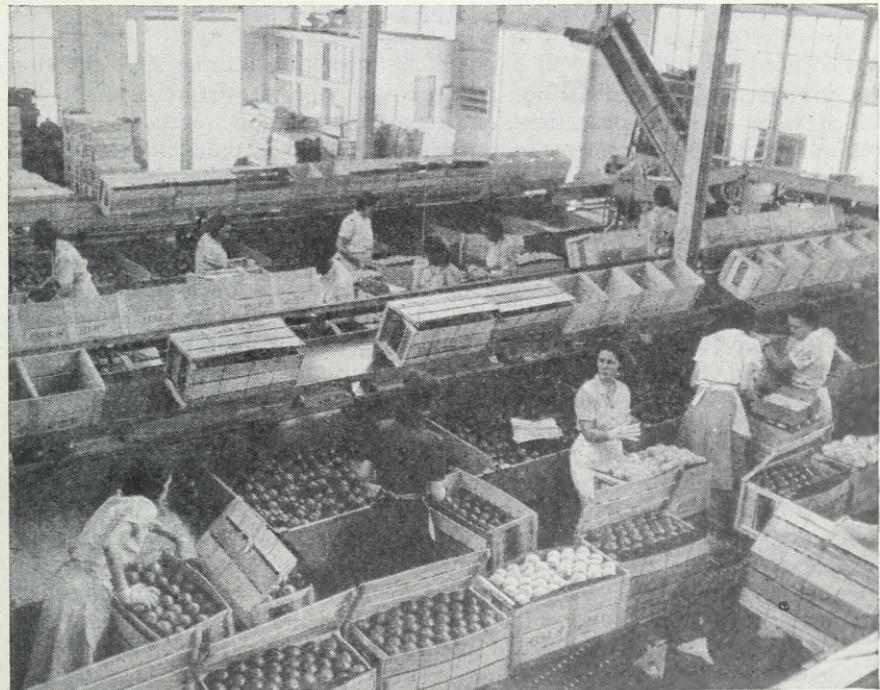


Figure 1.—The packing of fruits and vegetables in accordance with official standards, as done in this Florida citrus-packing house, is the first step required for orderly marketing and efficient buying and selling.

Clear and definite standards are indispensable in the settlement of disputes between buyers and sellers. They also make easier the settlement of claims against transportation companies when it is necessary to establish the value of a product before a fair adjustment can be made.

Standardized grades form the basis for market news prices and are necessary to permit an intelligent comparison of market prices.

Separation of products into various grades furnishes a basis for growers to pool their products in cooperative marketing associations in order that all may share equitably in the season's sales.

More effective distribution of fruits and vegetables is permitted by separating them into various grades. Market demands vary in different localities and effective distribution consists in finding the market that will give the greatest return for the grade of product offered for sale.

The desirability of standard grades as a basis for advertising is plain in that advertising is without meaning and therefore useless unless backed up by products uniformly graded and packed.

In the field of financing, either private or governmental, standardized grades are of first importance in establishing the value of products upon which loans may be made.

Finally, trading on the basis of quality is the greatest stimulus to better methods of production and marketing because it helps growers and shippers to correct their mistakes. It assists them to obtain proper remuneration by requiring them to adopt more careful and effective methods of growing, packing, and marketing their produce and to eliminate waste in handling.

ARTIFICIAL ICE AND THE REFRIGERATOR CAR CREATE NEED FOR STANDARDS

The need for standards and a system of inspection became apparent after the introduction of artificial ice and the invention of the refrigerator car, which were of such great significance to the fruit and vegetable industry. Naturally, these developments meant a great shift in producing areas and rapid expansion in production. Until about 1890, most of the fresh fruits and vegetables were produced on high-priced lands close to the cities and large centers of population; but with the development of long-distance shipping, made possible through artificial ice and the refrigerator car, production shifted from this high-priced land to cheaper new lands. Sandy lands in the Southern Coastal Plain became potential fruit- and vegetable-growing areas. It was about this time also that California and the Northwest began to enter the field as competitors of other production sections. California soon came to be known for its citrus and other fruits as well as for a large variety of fresh vegetables. Idaho went heavily into the production of potatoes, and Washington and Oregon engaged in the production of apples and pears. As time went on, other States became noted for the production of certain fruits and vegetables.

The rapid shift in producing areas and increased production also brought about a great change in American dietary habits. Most mature persons can remember when fresh fruits and vegetables out of season were a rarity. This was when everyone looked forward to the time when melons, tomatoes, and other such products would be ripe. Such delicacies were enjoyed only during the season that each reached maturity in its own particular locality, and tin cans from the grocers' shelves or jars from the home cellar furnished the chief supply of fruits and vegetables in winter. It is true that some fresh fruits and vegetables are still available only in season; but thanks to modern transportation systems and artificial ice, the seasons for the most perishable

products have been extended. Such fresh vegetables as head lettuce, celery, snap beans, cauliflower, broccoli, green peas, carrots, and peppers, are obtainable in the markets of the larger cities almost the year-round. In winter the department of perishables of any grocery store has probably become just as important as any of its nonperishable departments.

ABUSES BROUGHT ABOUT BY LONG-DISTANCE DEALING

As was to be expected, the changes brought about by the rapid shift from more or less local dealing to long-distance dealing in fruits and vegetables created many new problems. The late Wells A. Sherman,¹ who for many years administered the fruit and vegetable standardization and inspection work of the United States Department of Agriculture, describes the situation as follows in his book *Merchandising Fresh Fruits and Vegetables*:

The worst abuses which the produce business has ever known grew rapidly and naturally out of the conditions brought about by the universal ice supply and the refrigerator car. The wholesale handler of perishables in the city, whether he was a commission man or buyer, was no longer in personal touch with the grower. The distant grower seldom if ever visited the market and usually knew nothing of market prices or of the condition of his goods on arrival except what the receiver chose to tell him.

The inevitable happened. There was "easy money" for the unscrupulous man who could get goods sent to him on commission from afar. The industry became infested with a class of parasites who preyed upon the shipper and interfered with the business of the legitimate trader. . . . The abuses were not all on the city end. The distant shipper was often a plunger. He, too, was after "easy money." He had no reputation to maintain in the far-away market. He was often guilty of false packing. He frequently made little effort to exclude the stuff which should not have been shipped. If he had an opportunity to sell outright, his products were always represented as of the best. The city merchant who was unwilling to share the opprobrium which attached so generally to the commission business and who was willing to buy f. o. b. shipping point, found that he must reserve the privilege of rejection on arrival if the goods did not prove upon inspection to be of the kind and quality specified.

Thus, "f. o. b., usual terms" came to mean that the buyer took the goods after loading on cars at shipping point at an agreed price, but payment was deferred until the goods reached destination and had been inspected by the buyer. Around this method of sale other abuses have developed which are now in process of abatement.

Such a state of affairs as Mr. Sherman describes could not be prevented during the early part of the present century when there were no standards by which the value of produce could be measured. Abuses by tradesmen, however, were not all the handicaps that had to be endured because of this lack of common language. Without standards to measure gradations of quality, an equitable basis was lacking upon which to make future contracts. Descriptions could be made, but they were a poor substitute for definite standards. If a dispute arose between buyer and seller, there was no basis for settlement. Claims against transportation companies amounting to millions of dollars were difficult to settle because it was almost impossible to establish the value of a product.

Without standards there was no intelligible basis on which prices of produce could be compared. Even though a shipper was able to obtain price quotations for a product on different markets, these prices meant little because he had no way of knowing the quality on which they were based. He would always be in doubt as to whether a variation in price at different markets meant a variation in quality, or whether the price quoted was lower on one market than on another for the same quality of produce.

¹ SHERMAN, W. A. *MERCHANDISING FRESH FRUITS AND VEGETABLES; A NEW BILLION DOLLAR INDUSTRY.* 499 pp. 1928. (See pp. 37-38, 39.)

Lack of standards was a handicap to growers belonging to cooperative marketing associations because there was no practical basis for pooling their products. Without standards a basis was also lacking for the safe and successful use of credit.

Such were some of the problems that confronted the fruit and vegetable industry at the turn of the century, when the volume of produce being shipped was increasing by leaps and bounds.

FIRST ATTEMPTS AT STANDARDIZATION

Growers were really responsible for the first efforts to ease a bad situation and they took the first step in an attempt to establish a measure of commercial standardization by marking containers with their names. Many were successful in building up a personal reputation by packing a high-quality product or by honesty of pack. Growers' names and addresses are not so helpful to them now in selling produce as they were originally because the Federal Food, Drug, and Cosmetic Act, and most of the State standardization laws or rules and regulations established thereunder require that all containers be marked with the name and address of the packer or distributor.

The next step in the evolution of standardization was grading on the markets by commission men. Much of the produce coming into the markets was of poor quality and failed to meet the demands of the retail trade; but rather than criticize the producer whose business he wished to keep, the commission man did his own sorting and repacking. This grading in the city markets reached considerable proportions before the more definite State and Federal standards were established. Another common practice was for city dealers to send their representatives to country shipping points in order to purchase and supervise the grading and packing of products demanded by their trade.

Another development in standardization was the use of trade-marks and brands by some of the larger shippers' and producers' organizations. This development immediately preceded the use of definite, established standards and was in reality a primitive system of grading. The shipper who adopted a trade-mark or brand usually tried to have his fruits and vegetables meet certain standards or at least he did not allow the more defective products to get into the pack. Use of brands did not prove very successful, however, as dealers in the markets used them in competitive advertising and there was a general tendency to make the buyer think that the brands which a dealer handled were superior to the corresponding brands of his competitor. Brands and trade-marks are used extensively today but their use is often coupled with definite official standards.

Such were the first meager attempts by individuals and commercial firms to solve some of the knotty problems which confronted the fruit and vegetable industry before the establishment of State and national standards and before legislation was enacted to govern the standardization of fruits and vegetables.

GOVERNMENT PARTICIPATES IN FIELD OF STANDARDIZATION

Representatives of Congress in Washington naturally became conscious of the chaotic conditions existing in the fruit and vegetable industry through their constituents. The first attempt of the Federal Government to relieve the situation was in 1912 when Congress passed the Sulzer Bill, otherwise known as the United States Apple Grading Law. This act specified dimensions for the standard apple barrel and provided certain requirements for standard grades of apples of various sizes when packed in standard barrels. The act

provided a penalty of one dollar and costs for each barrel of apples sold or offered for sale if it was marked as to grade and failed to meet the requirements specified in the act. Packing of apples under the requirements of this act was voluntary, and the quantity so packed was insignificant.

Congressional action in 1913 marked the real beginning of concentrated effort by the Federal Government to aid the fruit and vegetable industry as a whole in the marketing of their products. In that year Congress made the first appropriation for conducting studies in the marketing of farm products. An appropriation of \$50,000 was made to enable the Secretary of Agriculture to diffuse among the people useful information on subjects connected with the marketing and distribution of farm products. Thus, the original authority for conducting investigations with a view to establishing standards came about through the passage of the regular agricultural appropriation bill and not through an organic act, as may be commonly supposed. This procedure has never been changed and each year since the item first appeared in the annual appropriation act, a similar provision has been approved.

Shortly after the first appropriation was made, the Secretary of Agriculture created the Office of Markets to carry out the work authorized by this provision. Workers were soon assigned to make field investigations, with a view to eventually establishing U. S. standards. During the first 2 years major efforts in this direction were devoted to potatoes, tomatoes, strawberries, cantaloups, and peaches.

In 1915, the need for national standards for fruits and vegetables was greatly emphasized by the inauguration of a telegraphic market news service by the Department of Agriculture. It soon became obvious that unless prices quoted were based upon products of comparable quality, no particular significance could be attached to price variations in the different markets. Staff technicians, therefore, redoubled their efforts in field investigational work with a view to establishing practical grades for the country as a whole.

Progress in formulating standards during the first few years was naturally slow. Investigators were obliged to visit all commercial producing sections where standards for any particular crop were under consideration. Countless numbers of meetings and conferences had to be held and there were many differences of opinion to iron out between growers, shippers, and receivers before standards suitable to the whole country could be formulated.

FIRST UNITED STATES GRADES ISSUED FOR POTATOES

At the time the United States entered World War I, the marketing of potatoes by grade was thought to be practicable. As it happened, the choice of potatoes as the first product for which grades were to be established, was a fortunate one. The 1917 crop was large and the Federal Reserve Board authorized its member banks to accept warehouse receipts as collateral security for loans for potatoes that had been properly packed, stored, and insured. The Board notified the United States Food Administration that since potatoes constitute a readily marketable nonperishable staple, they came within the regulation relating to commodity paper. Following this action of the Federal Reserve Board, the United States Department of Agriculture, and the United States Food Administration jointly recommended United States grades for potatoes, the use of which became mandatory on January 31, 1918, as far as the licensees of the latter organization were concerned. This ruling was not lifted until after the signing of the Armistice.

AUTHORITY GRANTED TO ESTABLISH A TERMINAL-MARKET INSPECTION SERVICE

It was about this time that Congress considered the establishment of a terminal-market inspection service. In an emergency act passed on August 10, 1917, to provide, among other things, for the national security and defense by stimulating the distribution of agricultural products, authority was granted to the Secretary of Agriculture to investigate and certify to shippers the condition as to soundness of fruits, vegetables, and other food products when received at important central markets. Immediately following this action, the Bureau of Markets, which grew out of the Office of Markets, established inspection offices in 34 of the larger markets, and by June 30, 1918, a total of 6,069 inspections had been made.

The following year Congress granted authority to make inspections in the markets, both for quality and condition, for receivers and other financially interested parties, as well as shippers, and to charge fees to defray the expenses of such services.

The establishment of an inspection service produced an urgent need for standards, and specialists in the field continued their investigations in order to fulfill this need as soon as possible. In 1918, the standardization investigations for strawberries and Bermuda onions were completed and grades were accordingly recommended. No new grades were issued in the following year, but in 1920 grades for northern-grown onions and sweetpotatoes were announced. Grades for cabbage and white Spanish peanuts were released in 1921.

INSPECTION EXTENDED TO SHIPPING POINTS

In 1922 another important step was taken by Congress which stimulated the need for national standards. In the agricultural appropriation bill for the fiscal year 1923, authority was given the Department of Agriculture to certify quality and condition of fruits and vegetables at shipping points.

With the passage of this act in 1922, the Department now had authority to establish voluntary standards for fruits and vegetables and to conduct an inspection service, both at shipping points and in the terminal markets. This, in fact, was all the authority required for the gradual expansion of a greatly needed system of national standardization. This procedure has not been altered, and since 1922 similar authority has been granted in the annual agricultural appropriation act each year.

The Department of Agriculture had anticipated that it might be called upon to make inspections at shipping points; even before the passage of the act in 1922, trained supervisors had been loaned to a number of Western States, which, by this time, were deeply involved in State inspection problems. Shipping-point inspection work was immediately reorganized on a cooperative Federal-State basis in a number of States, particularly in the far Western States. Several years later cooperative agreements for the conduct of the service were effective in all but a few States, and since 1942, all States have been a party to such agreements. Shipping-point inspections during the first fiscal year 1922-23 totaled 72,466. Inspection expanded rapidly during the succeeding years, until during the fiscal year 1946 a total of 684,894 carlots were inspected at shipping points, not including an additional 96,863 carloads of raw products inspected at processing plants. The total of all types of inspection in 1945-46, including those at receiving markets, was 895,285 carloads. Such figures are a glowing tribute to a governmental service maintained for the benefit of an

industry, when it is considered that inspection is voluntary and paid for by the industry.

STATES PARTICIPATE IN STANDARDIZATION PROGRAM

Since the Department of Agriculture had recommended grades for only a few products prior to 1922, it was necessary to make some inspections on the basis of the State grades then in force. It is well to note that during the period when the Federal Government was developing its standardization and inspection programs, similar programs were being conducted by the various States. The States began to pass legislation pertaining to the standardization and grading of various products in an attempt to abolish some of the abuses to which the industry had been subjected for a number of years.

New York was really the pioneer State to enact standardization legislation. A law was passed there in 1909 providing that no person could sell or brand apples, pears, or peaches as grown in New York State unless they actually had been produced within the State. This act was amended in 1911 to include the first grade requirements for apples. In 1913 Montana and Maine passed the first mandatory apple-grading laws. In 1914 the State of New York passed similar legislation and Massachusetts, Delaware, Connecticut, and California followed with apple-grading legislation in 1915. Several other States issued grades for apples and other products, either by legislation or regulation, prior to 1919.

Enactment of State standardization legislation really began in earnest following World War I when most of the so-called general State standardization laws were passed. These laws served to provide the States with the necessary authority to establish official standards for the grading and inspection of fruits and vegetables and other products. Most of such laws authorize an officer in authority, such as the commissioner of agriculture or the director of markets, to promulgate official standards for fruits, vegetables, and other products, as well as standards for containers of those products. Provisions are usually made for the appointment of inspectors, charging of fees for inspection, making certificates *prima facie* evidence in all State courts, prescribing rules for the marking of containers, and making such rules and regulations as necessary for conducting a standardization and inspection program.

To give the history of all the State legislation that has been enacted with respect to the standardization of fruits and vegetables would require volumes and the information would not be particularly pertinent to this discussion. Suffice it to say that to date all States except Iowa have passed one or more laws on the subject. In 40 States laws specifically require that U. S. standards shall be official for one or more products, or an officer with authority by law has officially promulgated U. S. standards for one or more products. States not included in this group are Arizona, California, Iowa, New Mexico, North Carolina, South Carolina, Rhode Island, and Wyoming. However, in all of these States except Rhode Island, U. S. standards are used very extensively as a basis for packing most of the commercial fruits and vegetables produced.

RAPID PROGRESS IN ISSUING STANDARDS SINCE 1921

Beginning in 1922, the standardization project in the newly created Bureau of Agricultural Economics, which took over the duties of the Bureau of Markets and Crop Estimates, was able to increase substantially its issuance of standards. In that year, grades for asparagus, cauliflower, celery, cucumbers, lettuce, peaches, and tomatoes were issued and those for cabbage and potatoes were

revised. For each of the next 10 years, an average of about 6 new standards for fruits and vegetables were added and, of course, many of those previously issued were revised. At the end of the fiscal year ending June 30, 1931, a total of 67 new standards, covering 50 different commodities, had been recommended. By this time, U. S. standards had been issued for the principal products, so during the ensuing years technical employees were able to devote more time than previously to developing standards for some of the less important commodities.

Some new standards have been formulated every year since 1920. To date, U. S. standards for 68 different products have been issued. Since two or more standards are necessary for some products, owing to differences in types and uses, a total of 114 sets of standards have been issued. These include 99 standards for 61 different fruits and vegetables and 15 standards for 7 other products not classed as fruits and vegetables, such as peanuts, pecans, walnuts, and tomato plants.

The order in which U. S. standards have been developed has been determined largely by the needs of the various industries. No standards have been issued unless there was enough evidence to indicate that their recommendation would be a benefit to the particular industry concerned. In spite of the large number of U. S. standards that have been issued, the field is not yet covered; there are still some products for which standards have not been issued. Then, too, the standards recommended thus far have been primarily for use in wholesale trading or for the purchase of raw products for processing. Standards have been issued for only a small number of raw products that are processed, which leaves a large field for the development of new standards as the need arises.

Recent popular demand for consumer standards, both from consumers and distributing organizations, may soon open a completely new field for the development of standards.

U. S. STANDARDS PERMISSIVE IN CHARACTER

Generally speaking, the U. S. standards for fresh fruits and vegetables are permissive standards; that is, their use is optional as far as the law under which authority is given for their issuance is concerned. Certain other Federal and State laws, however, grant authority for making the grading of produce compulsory under certain circumstances. The Export Apple and Pear Act, enacted in 1933, is a mandatory Federal act which provides that it shall be unlawful to ship apples or pears in the raw state to foreign countries, except in less than carlots, unless they meet certain minimum grades prescribed by rules and regulations of the Secretary of Agriculture.

Under provisions of the Marketing Agreement Act of 1937, authority is granted for restriction of shipments of produce by grades and sizes in marketing agreements and orders. Thus, during recent years, grading of certain products under the provisions of such agreements and orders has been made compulsory during the period of time covered by such agreements and orders.

Compulsory grading of many fresh fruits and vegetables in accordance with requirements of official U. S. standards is required by the provisions of many State laws. A few States also require compulsory inspection of some products, either by law or by regulations under lawful authority.

BASIC PRINCIPLES FOLLOWED IN DEVELOPING STANDARDS

Through experience, certain basic principles have been recognized as fundamental in the development of a practicable and useful set of standards. Prob-

ably the most important principle is that a set of standards for a fruit or vegetable must recognize definite gradations in quality of the entire supply. This means that they must be applicable to all portions of the supply before they can serve as an equitable basis for trading in the commodity.

In the development of a set of standards, the standards for grades are the most important. It must be recognized, however, that U. S. standards also include standards for things other than grades, such as standards for bunching, in the case of bunched vegetables, or standards for packing, which usually deal with such factors as the arrangement in the containers, uniformity of size, and tightness of pack. Thus, upon inspection, a product might meet the requirements of a grade but fail to meet the standards for packing, or vice versa, and be so reported.

In developing standards for grades, the highest grade in a set of standards represents the quality and condition characteristics most desired by the trade and which command the highest prices in the markets. The lower grades represent qualities not so desirable but which have good food value and are merchantable. Naturally, the lower grades, under normal marketing conditions, command lower prices than the higher grades. The number of grades included in a set of standards depends to a large extent on the number of distinct gradations of quality that the industry makes and which is usually governed by relative value of the product. For example, it is feasible to have more grades of quality for such products as citrus fruits, apples, and pears, which have relatively high value, than for cabbage and some of the root crops, which have a relatively low value and which, from the growers' or shippers' viewpoint, do not warrant sorting into so many grades.

In formulating standards for fruits and vegetables, the Department of Agriculture, in the beginning, adopted the numerical system of nomenclature for grades, with some exceptions. In general, the designation "U. S. No. 1" was given to the highest grade for a product. U. S. No. 1 grade, as a rule, represents good, average quality that is practicable to pack under commercial conditions. Usually, under normal growing conditions, better than half of the crop will be of U. S. No. 1 grade.

The designation "U. S. No. 2" ordinarily represents the quality of the lowest grade that is deemed practicable to pack under normal conditions. Minimum requirements for a U. S. No. 2 grade are usually set low enough so that shippers ordinarily would not deem it advisable to ship products which will not meet the requirements of this grade. Exception to this rule, of course, would be made when an acute shortage of a commodity occurred.

The term "Unclassified" has been adopted to describe produce which has not been graded in accordance with the requirements of any grade. It is not considered a grade but is provided as a designation to show that no definite grade has been applied to a lot.

In formulating standards for some products, it was found that the U. S. No. 1 and U. S. No. 2 designations were not sufficient to represent all of the gradations of quality packed by shippers in the case of a number of the more highly specialized products. Many shippers of these commodities preferred to pack a top-grade product of high color perhaps and practically free from defects and for which they would receive premium prices. Thus, it was necessary in some sets of standards to provide a grade designation for a product superior to that ordinarily termed "U. S. No. 1," so the designation "U. S. Fancy" was chosen to describe such quality. Ordinarily, the percentage of a crop packed to meet the requirements of a U. S. Fancy grade is relatively small.

In a few standards it has been found necessary to provide a grade designation for a quality of a product between U. S. Fancy and U. S. No. 1, as in the

standards for peaches and potatoes. The designation "U. S. Extra No. 1" is applied to this quality.

It has also been necessary to provide an intermediate grade between U. S. No. 1 and U. S. No. 2 in the standards for a number of products in order to provide a designation for quality not up to the U. S. No. 1 standard, but noticeably superior to the U. S. No. 2 quality. The terms "U. S. Commercial" and "U. S. Combination" were adopted to describe this quality. Minimum requirements for a U. S. Commercial grade are slightly lower for some factors than those for U. S. No. 1. U. S. Combination denotes a grade made up of a certain percentage of specimens meeting the requirements of U. S. No. 1 and U. S. No. 2 grades. These grades are often used to pack a crop which is below average in quality owing to abnormal growing conditions, or they are used as a grade designation for a lot packed to meet a higher grade but which fails in some respects.

The U. S. No. 3 grade designation is used only in the standards for citrus fruit, a highly specialized product which lends itself to separations into many different classifications.

In developing the names and number of grades used for U. S. standards for fruits and vegetables, each product has been considered separately, and the aim has been to formulate standards, upon the basis of trade practices, that will fulfill the needs of each particular industry. Some criticism has been made of the system of grade names, in that such terms as "U. S. Fancy" or "U. S. Extra No. 1" are misleading and represent hidden grades. Such criticism, however, has usually come from persons not using the standards, rather than from growers, shippers, and receivers whom the standards are intended primarily to benefit. Members of the produce industry are generally well acquainted with requirements of standards and are not usually confused by grade names which digress slightly from the straight numerical system. In fact, the use of terms other than numerical in U. S. standards has been included in practically all instances at the request of the industry.

REQUIREMENTS OF STANDARDS REPRESENT TRADE DEMANDS

Contrary to the belief of some persons that requirements of grades in U. S. standards represent the theories of inexperienced departmental employees, grade requirements for the most part actually represent the ideas of members of the particular industry concerned. The small staff of technical employees, who finally put the standards into words, are really only the referees. Whenever demands for a set of standards are considered sufficient to warrant going ahead with their development, a member of the technical staff is assigned to the field to make the necessary investigations. Representative growers and shippers in all of the principal producing sections are visited and their ideas solicited.

Often, meetings of representatives of the industry are held in the various producing sections. Grading and packing operations are observed and the principal defects of the commodity are noted for each growing region. Receivers in the markets are also consulted as to their ideas of grade requirements. Often it is necessary to consult fruit and vegetable specialists and pathologists at universities and colleges of agriculture to obtain details concerning certain diseases and insect injuries that affect a particular crop.

Information is gladly received from all sources that may be able to offer something of value in setting up workable grade requirements. Naturally, there are many differences of opinion to iron out, and this is where the field investigator plays his part as the referee. When he feels that he has obtained the necessary information to formulate a set of standards, he draws up the original

draft, incorporating the suggestions which he has obtained from his investigations in the field. The proposed standards are then reviewed by members of the technical staff in Washington, all of whom now have had many years of experience in standardization work. Before issuing the standards as official, however, copies are often sent back to trade representatives and inspection supervisors in the various States for final criticism.

The period of time necessary to formulate a set of standards varies with the commodity. Sometimes investigational work for certain products may be completed and standards recommended within a few weeks. Again it may take months, and for some products the investigations have taken parts of several years. It has always been the policy of the Department not to issue standards for official use until they are considered practicable and workable.

UNIFORMITY OF LANGUAGE IN REQUIREMENTS FOR STANDARDS

Anyone who has occasion to use U. S. standards for fruits and vegetables will note a considerable degree of similarity and uniformity in the wording of the grade requirements. Such uniformity of language is maintained for the purpose of making them more easily understood by inspectors and members of the industry who use the standards. Similar terms and expressions in one set of standards usually have similar interpretations in others, even though they apply to different commodities.

In formulating the standards, it has been the policy to follow a certain order in listing the grade factors. Such factors as color, shape, freshness, and firmness, and other factors which have to be defined in more or less general descriptive terms, are usually given first. Then usually follows freedom from certain defects, such as decay, and freezing injury or other defects of a serious nature. For the grade factors covering the less serious defects, in which it is desirable to allow a certain degree of injury, the expressions "free from injury," "free from damage," "free from serious damage," and "free from very serious damage" are generally used.

Each expression in the order named signifies a greater degree of injury. Thus, in a U. S. Fancy grade, where it is intended that only a slight degree of injury for certain defects be permitted, the expression "free from injury" is used. "Free from damage" is usually used for certain grade factors of U. S. No. 1 grade, which would be interpreted as an injury not materially affecting appearance, edible or shipping quality, or as causing more than perhaps appreciable waste. The expression "free from serious damage" is associated generally with certain grade factors in U. S. No. 2 grades and finally, "free from very serious damage" with those in U. S. No. 3 grades. It is often necessary, however, to use two or more of the above expressions in one grade for certain factors.

Frequently, U. S. standards have been criticized for being too lengthy and too technical. It has been the policy of the Department to make standards as simple as possible but it must be remembered that the extent to which a standard reflects relative value of a product depends to a large extent on the completeness with which it defines various grade factors that influence quality. Therefore, whenever possible, grade factors are defined as definitely as possible in order to facilitate uniformity of interpretation. Descriptive standards, to be practical, must be reasonably specific. Some factors are very easily defined by specifying the size of an area or the percentage of the surface of a specimen which may be affected. Other factors, such as color, firmness, and shape, are very intangible and can be defined only in general descriptive language.

TOLERANCES IN U. S. STANDARDS

Early in the development of U. S. standards as a basis for wholesale trading, it was found necessary to provide suitable tolerances in the various grades in order to allow for variations incident to proper grading and handling. Persons inexperienced in the application of standards often question the need for tolerances. To appreciate the necessity for them, however, such persons need only to visit a packing shed where any product is being graded and packed for shipment.

In any commercial preparation for market operation it is necessary that sorting and packing be done rapidly in order to hold costs to a minimum. Certain types of products, such as apples, peaches, citrus fruits, and onions, usually are passed over movable conveyor belts, and defective specimens are removed by sorters as they move along on the belts (fig. 2). Under such a system, it is not humanly possible for employees to see all defects in specimens, especially those which are not plainly visible, such as very small worm holes in apples or peaches. Consequently, a few defective specimens naturally go into the packed containers and unless reasonable tolerances are provided in the grades, products would rarely, if ever, meet grade requirements.

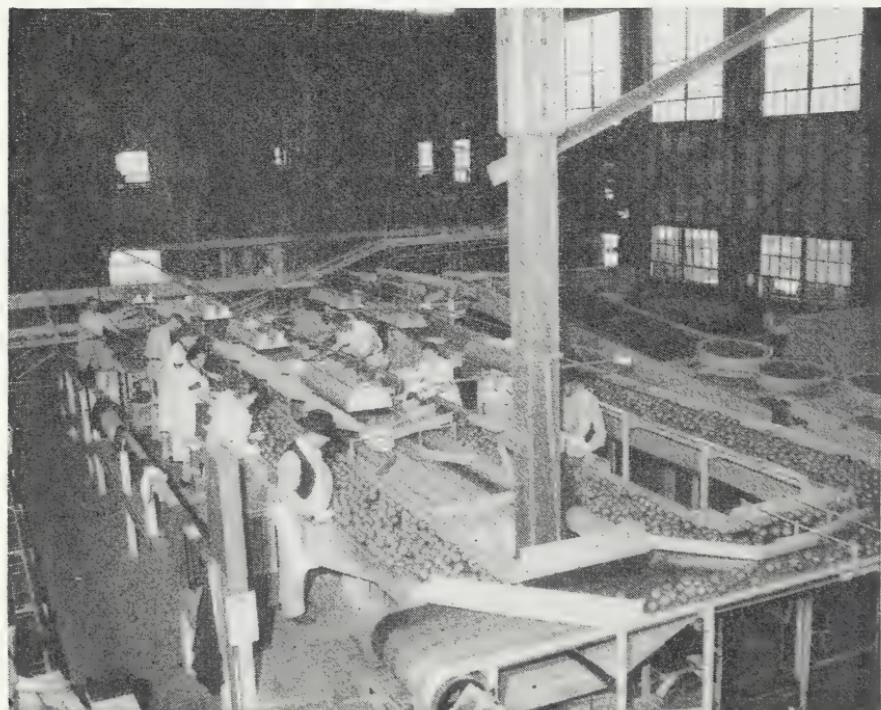


Figure 2.—Sorters grade oranges on movable conveyor belts in a Florida packing house.

The percentage of tolerances provided in grades for specimens failing to meet grade requirements varies with the different products, usually from 5 to 10 percent. The latter tolerance is the most prevalent. However, serious defects resulting from freezing injury and soft rot which may develop further and spread to other specimens, are usually restricted to 1 or 2 percent. Where a total tolerance of 10 percent is allowed in certain grades, often this total is

restricted to 5 percent for certain serious defects other than soft rot and freezing injury.

STANDARDS FOR RAW PRODUCTS FOR PROCESSING

In addition to developing U. S. standards for use in wholesale trading in fresh fruits and vegetables, the Department of Agriculture has formulated U. S. standards to serve as a basis for purchasing certain raw products for processing. The first set of such standards was issued in 1923 for cannery tomatoes. These standards were revised in 1926 and since that time their use has extended to all the principal States which produce tomatoes for processing. In 1933 separate standards were recommended for tomatoes for the manufacture of strained tomato products, and during recent years about a third of the crop used for processing has been purchased on the basis of these two sets of standards. During the 1945 season, 812,232 tons were inspected by Federal-State inspectors.

U. S. standards have also been issued for raw products for processing as follows: Apples, asparagus, snap beans, lima beans, beets, cabbage, carrots, red sour cherries, sweet corn, pickling cucumbers, grapes, onions, freestone peaches, pears, peas, spinach, and strawberries. Copies of these standards, as well as U. S. standards for use in wholesale trading, are issued in separate pamphlet form and can be obtained free of charge on request from the U. S. Department of Agriculture, Production and Marketing Administration, Washington 25, D. C. A check list showing the products for which such standards have been issued and their effective dates is also available from the same source.

Before U. S. standards for raw products for processing were issued, it was the usual practice for canners and processors to purchase their supplies at a certain flat rate per unit. Under such a system, they often experienced great difficulty in getting the quality of product necessary to pack a high-quality finished product. Processors must have ripe fruit and tender vegetables in order to make the best quality of finished products. Under the flat-rate system of payment, many growers were not particularly careful about bringing in their crops at the time they were at the most desirable stage of maturity for processing. For example, tomato growers often delivered tomatoes that were not red-ripe, and corn growers sometimes let the ears get overmature before harvesting, in the belief that they would get more weight. The establishment of standard grades has largely corrected these practices.

U. S. standards for raw products for processing are designed to do away with the outmoded flat-rate method of purchase. This was done by providing two or more grades in each set of standards. In the correct application of the standards, processors pay premium prices for the percentage of a delivery that will meet requirements of the highest grade and correspondingly lower prices for the percentages which meet requirements of the lower grades. Usually no money is paid for culls. Such a system of payment for produce provides an incentive for the grower to deliver the highest percentage possible of the higher grades, as this gives him greater returns per unit of delivery. The system benefits the processor by enabling him to keep his production costs at a minimum, because less labor is required to prepare the product, his yield per unit purchase is greater, and finally, he is able to pack a higher quality of finished product for which he receives greater returns. Even the consumer benefits under such a system by being able to purchase a better quality of processed products.

Many fruits and vegetables are being processed for which U. S. standards have not yet been developed. Dehydration and quick-freezing of fruits and

vegetables have extended the need for U. S. standards for more products. It is the plan of the Department to provide such standards as the demand increases and time permits.

THE INSPECTION SERVICE

Most of the preceding discussion pertains to the history and development of U. S. standards by the Fruit and Vegetable Branch of the Production and Marketing Administration and its predecessors. The discussion that follows will take up the practical application of the standards.

As previously stated, the inspection service has been active since 1918 when Congress provided for inspection at receiving markets; 4 years later, in 1922, Congress provided for extending the service to shipping points. At the present time, Federal inspection offices are maintained in 54 of the larger cities throughout the country and all 48 States cooperate with the United States Department of Agriculture in rendering service to growers and shippers at shipping points.

Shipping-Point Inspection

The shipping-point inspection service is maintained in the various States by means of cooperative agreements between the Federal Government and some State agency. The cooperating State agency is generally the State department of agriculture, although in a few States it is with some other agency, such as the State college of agriculture. Agreements are now in force in all the States, and shipping-point inspection is available to financially interested parties in practically all commercial-producing districts (fig. 3).

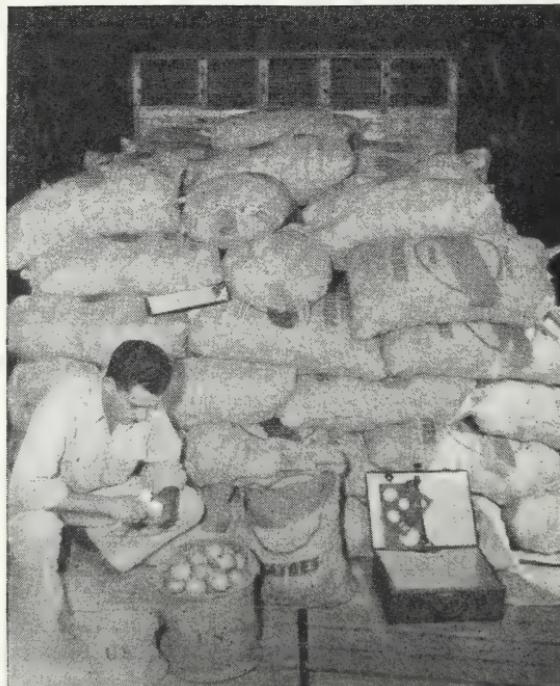


Figure 3.—Federal-State inspector inspects potatoes in a partly loaded car at a North Dakota loading station.

Differences in State laws account for some variation in the provisions of agreements, namely, in the salaries of supervisors and inspectors, disposition of fees collected, and other such matters. In general, however, agreements provide that the service shall be under the joint direction of the Federal and State agencies. The Federal supervisor licenses the inspectors and is directly responsible for their training and supervision in the interpretation of standards, methods of making inspections, and certificate writing. Hiring of personnel, collection and disposition of fees, and the like, are left largely to the State cooperating agency. Inspectors must demonstrate to the satisfaction of the Federal supervisor that they are capable of properly inspecting the products for which they are licensed.

In most of the important fruit and vegetable producing States where shipments are made throughout most or all of the months during the year, Federal supervisors maintain their offices the year-round. In some States, however, where the deals are short, as is the case in several States east of the Mississippi River, the Federal supervisor remains only during the active shipping season. Licensed inspectors in the latter States also move from State to State as shipping seasons progress. Many inspectors who work in Florida and Texas during the winter months, follow the crops northward during the late spring and summer months and return to the South in the fall for citrus and winter vegetable inspection. In this manner they secure almost year-round employment. No small tribute is due these Federal-State inspectors, who, as they follow the crops and move from place to place year after year, do so at real sacrifice to family life.

The extent of the organization of the shipping-point inspection service within a State is largely dependent upon the volume of work to be handled. In the more important producing States of California, Florida, Texas, Washington, Oregon, Idaho, Colorado, and some others, where large shipments of varying kinds of produce are made the year-round, an extensive organization of inspectors is required. The Federal supervisors in such States have found it necessary to establish branch inspection offices in the various producing districts. Competent and experienced inspectors are placed in charge of these offices and every effort is made to render quick and efficient service to applicants for inspection. Certificates of inspection are usually typed in and mailed from these branch offices, because to have this work done in the central State office would cause considerable delay.

In contrast to this type of highly diversified shipping-point inspection work, the bulk of the inspection work for the year in some States is handled through one central temporary office where possibly a large volume of work may be confined to one or two crops for a short period of time. The Georgia peach deal, the Mississippi cabbage deal, and the early potato deals in the Atlantic seaboard States are examples of deals of this sort.

The shipping season for these crops lasts for only a few weeks or months and shipments inspected during these short periods constitute the bulk of the shipping-point inspection work for the year. Consequently, the Federal supervisor in charge of the deal sets up an organization to handle it adequately, after which the temporary office may be closed until the following season. Miscellaneous requests for inspection of the products produced in smaller volume at various times are then handled from the State's headquarters for shipping-point inspection.

Training Shipping-Point Inspectors

At the beginning of a shipping season of an important crop, the Federal supervisor usually assembles his inspection force, including experienced and inex-

perienced men, for training in grade interpretations and general inspection procedure. In some States regular training schools for inspectors are held prior to the opening of a shipping season or a canning deal. In Ohio and Indiana where about 85 and 150 inspectors, respectively, are employed to inspect the tomatoes delivered to canneries for processing, training schools are held annually for them just prior to the harvesting season. Such schools are considered necessary for the proper training of such large groups of men, because uniformity of grade interpretation is of great importance in the proper conduct of the service. Similar schools are held in Florida, Texas, California, Washington, Maine, and many other States for training inspectors to inspect such important crops as citrus, apples, and potatoes.

At these schools trainees are instructed in all phases of the inspection of the product covered in the school. They are given copies of the U. S. standards for the product and are expected to become familiar with all the requirements of the various grades. Probably the most important attribute of a capable inspector is a thorough knowledge of the grades of the fruit or vegetable he inspects. He must be able to identify the various defects and diseases that affect the particular product and to place the individual specimens in their correct grade classification. Various methods are employed to enable the inspector to gain this necessary knowledge. Supervisors and other trained inspectors assist him by demonstrating the sorting of samples of the product into their proper grade. For scoring certain defects, grade definitions are specific and the inspector needs only to follow the written specifications. Certain other types of defects, such as those classified as "off-color" or "misshapen," can be defined only in general descriptive terms, so he must gain this information by being shown specific examples of a product with such defects or by other painstaking methods.

Skill in the proper interpretation of grade defects is not the only attribute of a good inspector. He may be able to score grade defects of a certain product perfectly, but unless he can accurately record and report his findings, his inspection is worthless. Thus, a good inspector must demonstrate his ability to write legibly and record his notes in systematic and proper form, as these are the basis of his final report on the inspection certificate. Ability to describe and report his findings on the final inspection certificate, accurately and in accordance with instructions, is just as important in making an inspection as accurate judgment in appraising the physical aspects of a product.

One of the principal aids in training new inspectors and enabling the inexperienced ones to properly interpret various grade factors for certain products is by use of imitation fruits and vegetables modeled and produced in the Department. These plaster models are painted by artists who have become highly skilled through long experience, and they are used to illustrate the lower limits of a grade for many products. Such models are particularly helpful in illustrating defects of color or shape, because it is impossible to define these factors in descriptive language. It is not feasible to furnish plaster models to all inspectors, owing to the length of time necessary to prepare them, and the cost. However, over a long period of years the Department has been able to supply each Federal supervisor, as well as each receiving market inspection office, with many models, and each year new ones are added to the list. Such models aid materially in maintaining uniformity in the interpretation of grades throughout the country.

Photographs, both colored and uncolored, are also used to a considerable extent to illustrate various grade defects of certain products.

At the conclusion of training, new inspectors are usually given a written examination to determine their grasp of the subject. Even after receiving instruction in such schools, new inspectors are usually assigned to work with older experienced inspectors before they are allowed to proceed alone.

During the first year, a new inspector may work on only a very few products—possibly on only one. Thus, the Federal supervisor would license him to inspect only those products for which he demonstrates special fitness. As time goes on, he may receive training in the inspection of additional commodities, in which case, these commodities would be added to his license card. As an inspector's license is extended to cover additional products, he naturally becomes more valuable to the service. However, it may require several years of experience before he is proficient in the inspection of as many as a dozen products. Experience often qualifies an inspector for better paying positions in private industry. Some become packing house managers. Others become marketing specialists in the United States Department of Agriculture. Others fill desirable marketing jobs in the State governments and in industry.

Inspection Procedure

Many large shippers who operate packing houses place blanket orders with the inspection service for inspection of all of their shipments. Federal supervisors or keymen in charge of the field office nearest the packing plant usually assign certain inspectors to be responsible for the work at such packing houses. The inspector, therefore, upon reporting to the packing house in the morning, ascertains from the shipper or his foreman what cars are to be loaded and inspected that day. The smaller shippers may place their orders for inspection by telephone with the nearest inspection office where the Federal supervisor or keyman in charge assigns inspectors to various points in the vicinity in accordance with the work requirements of the day.

Let us assume that a licensed inspector has been assigned to a certain packing house to make an inspection of a car of boxed apples being loaded, and note the procedure he might follow in making and reporting the inspection. Upon arriving at the packing house he would probably select a package of the product being graded by the sorters and examine perhaps 50 apples from the packed container. He would score defective apples or off-sized apples in the sample and note the information on his score sheet. Then he would probably immediately select another packed box and score a similar sample.

Inspection of a few samples would, no doubt, indicate whether or not the sorters were doing their work properly, and the inspector would so report his findings to the packing-house foreman. If the samples were found to be close to the borderline for the grade being packed, the foreman would probably request his sorters to be more careful. Such information given by the inspector is very helpful to the packing-house foreman, as it may save much time and labor cost in loading out a car of a certain grade of product.

Assuming that the inspector found the few samples he selected within the grade tolerance, he would probably then take time to make other necessary entries on his work sheet of information finally to be shown on the inspection certificate. He would record the time and date that he started the inspection, the car number and initials, the kind of car, the name and address of the applicant for inspection, and the name of the shipper. He would then probably look over the car and note and report to the foreman any defect in equipment that might affect the shipment. Before completing his inspection, he would note on his work sheet the condition of the bunkers with respect to the amount of ice, position of hatch covers, and whether plugs were in or out and drain pipes were open or closed.

Next, under the heading "Products," he would show the name of the product, variety if known, the kind of container with its identifying marks and brands, such as would appear on the label or on the box, the size of the apples stamped on containers, and the lot numbers. Before completing the inspection, he would

note on the work sheet the number of containers loaded in the car as found by actual count or by shipper's manifest.

By this time, the inspector would probably select at random more packed boxes, examine samples from each, and record his findings on the note sheet. The record would give the number of defective and off-sized apples in each sample, as well as indicate the range of color, shape, and the stage of maturity. As loading of the car progressed, he would also note on the work sheet the method of loading the car, the number of rows and layers of boxes, the stripping of the layers, and whether the car was loaded full length or in the ends with center bracing between doors.

During the course of the inspection, the inspector would probably examine samples from at least 15 packed containers as a basis for reporting the size and the quality and condition of the shipment. If he found irregularities in the samples inspected he would examine more samples than he would if they ran quite uniform in grade defects. In any case, the inspector would examine as many samples as he believed necessary to be representative in size, quality, and condition of the shipment. Upon completion of his examination of samples he would then total his score of various defects and off-sized apples, and calculate the percentages. He would then be ready to enter the size and quality and condition statements for the car as a whole on his work sheet.

If the average of defective apples was within the tolerances specified in the grade packed, he would enter the name of the grade under the grade heading. If the average exceeded the tolerances, he would report the load as failing to meet the grade and the reasons therefor. Before leaving the car, the inspector would note the time of completing his inspection, and as a final step tack up a card to show where, when, and by whom the car was inspected.

Before leaving the packing house, the inspector would recheck all his notes, including the one covering the car number, to see that all information was completely and accurately recorded. Upon returning to the inspection office, which might not be before nightfall if he had other cars to inspect, the inspector would hand in his work sheet to the supervisor or inspector in charge, who would also check the information entered on the sheet before having the certificate typed for mailing to the applicant. A copy of the typed certificate is attached to the work sheet for filing in the inspection office. Such is the usual procedure in inspecting a car of fruits or vegetables at shipping point, with variations, of course, to take care of different products and situations.

A reproduction of a typical shipping-point inspection certificate, which is furnished each applicant for inspection, is shown in figure 4.

Why Shippers Take Inspection

The question is often asked as to why growers and shippers are willing to pay several dollars for a little sheet of paper giving a description of a carload or truck-load of produce when inspection, so far as the Federal Government is concerned, is not compulsory. In the first place, he knows that the information given on the inspection certificate is accepted as *prima facie* evidence of the facts stated therein by all Federal courts and most State courts.

Consequently, if he has a contract with a distant buyer to deliver a carload of a product of a certain grade, as shown on the certificate, he has the satisfaction of knowing that his shipment complies with the grade provisions of that contract and if, for that reason, the shipment is not accepted by the receiver, the latter must prove just cause for the rejection. He regards the few dollars invested in the inspection service as cheap insurance, and indeed it is when compared

F. P. L. 20

ORIGINAL

UNITED STATES DEPARTMENT OF AGRICULTURE
VIRGINIA DEPARTMENT OF AGRICULTURE AND IMMIGRATION

Nº 4377

INSPECTION CERTIFICATE

This certificate is issued in compliance with the regulations of the Secretary of Agriculture governing the inspection of various products pursuant to the Act making appropriations for the United States Department of Agriculture, the Act of Virginia Assembly, and is admissible as prima facie evidence in all courts of the United States and of Virginia. This certificate does not excuse failure to comply with any of the regulatory laws enforced by the United States Department of Agriculture, or by the Virginia Department of Agriculture and Immigration.

Inspection point Winchester, Va. Billing point Winchester, Va. Date Oct. 4, 1945

Applicant Winchester Packing Co. Address Winchester, Va.

Shipper Same Address Same

I, the undersigned, on the date above specified made personal inspection of samples of the lot of products herein described, and do hereby certify that the quality and/or condition, at the said time and on said date, pertaining to such products, as shown by said samples, were as stated below.

Car initial and number FGEX 5 1 8 1 3 Kind of car Refrigerator

Inspection begun 1:30 P. M. Oct. 4, 1945 Inspection completed 6:15 P. M. Oct. 4, 1945
(Hour, date) (Hour, date)

Car equipment and condition at completion of inspection:

Products: York Imperial APPLES - in tub type bushel baskets labeled "W Brand, Winchester Packing Co., Winchester, Va." and stamped "U. S. No. 1, 2½ inches up, York." Loader's count 516 baskets.

Loading: Through load, end to end offset, 3x3 rows, 4 layers.

Pack: Tight. Ring faced. Paper pads under lids. Good amount of oiled paper distributed uniformly through baskets.

Size: Generally 2½ to 3, mostly 2½ to 2½ inches in diameter.

Quality and condition: Mostly well formed, some fairly well formed, clean, 15% to full red, mostly 25% to 50% good red color. Grade defects within tolerance. Generally hard. No decay.

Grade: As marked, U. S. No. 1, 2½ inches up.

Fee \$5.16,
Expenses,
Total 5.16

L. F. Laney

Inspector.

PLEASE REFER TO THIS CERTIFICATE BY NUMBER

Figure 4.—The Federal-State inspection certificate is an official record of the grade, condition, and description of the shipment.

with the loss that might be incurred in case of the unjust rejection of even one car of produce.

There are other advantages which the shipper appreciates also. Many large shippers receive valuable assistance from the inspectors in the proper methods of grading, packing, and loading their produce for shipment. Inspectors are not required to carry on such educational work, but when asked, and time permits, they are only too willing to pass on their knowledge to others.

Aside from all other advantages, many shippers feel that the cost of the service pays them well simply from the psychological effect that the presence of the inspector in the packing house has on the quality of work done by the employees.

Inspection of Raw Products for Processing

Federal supervisors in the various States also supervise the inspection of raw products for processing at canneries and other processing plants. In a few States this type of inspection reaches greater proportions than the regular carlot shipping-point inspection of fruits and vegetables for fresh market. Such inspection calls for somewhat different procedure than carlot inspection. The canner or processor, who usually is the applicant, must necessarily make application for inspection considerably in advance of the harvesting season in order that the inspection service may make the necessary arrangements to furnish the service.

In connection with the inspection of raw products, Federal supervisors and inspectors give a great deal of service to growers by demonstrating the application of the U. S. standards for the products. For cannery tomato inspection in particular, where color of the tomatoes is such an important factor, inspectors take time at the beginning of the season to show growers which ones they should pick in order to receive maximum returns for their product. Also, Federal supervisors and inspectors are often called upon to demonstrate the application of the U. S. standards at picking schools held throughout producing areas (fig. 5). In this manner, growers learn the requirements of the standards and are able to instruct their pickers accordingly.



Figure 5.—Federal Supervising inspector demonstrates to growers, canners, and canners' fieldmen at an Indiana picking school how to pick tomatoes for processing to meet the requirements of United States standards.

Licensed inspectors are usually assigned to a processing plant or a loading station for the season. Charges for inspection are placed on a weekly basis. The cost varies in different States, but at present, the range is from about \$65 to \$75 per man per week. Such charges include the inspector's salary, cost of supervision, and supplies other than inspection equipment.

Equipment for the inspection of raw products usually consists of an inspection table, scales for weighing samples, containers, such as galvanized tubs or buckets for holding samples, a slide rule or computation chart for calculating percentages, and various other miscellaneous articles. Speed is essential in inspecting raw products so that deliveries can be kept moving into the processing plant and loss of time to growers and truckers be held to a minimum. For this reason, considerable attention is given to providing good and properly arranged equipment.

Tables for the inspection of tomatoes, for example, are usually constructed with four compartments to hold the tomatoes of various grades as they are sorted. The tops of the tables are also made so that they can be tilted for dumping the sorted tomatoes into buckets resting on scales. Many processors furnish scales with dials extending above the tops of the tables, so that the inspector can read them without leaving his position at the front of the table.

In actual inspection procedure, the inspector selects containers from growers' loads, believed by him to be representative of the lot, as they are delivered to the processing plant or loading station. He then carefully dumps the selected samples



Figure 6.—Federal-State inspectors grade samples of tomatoes from growers' loads being delivered to a cannery in Ohio. U. S. No. 1 tomatoes are placed in the center compartment of the tilt-top table, and U. S. No. 2's and culls are placed in the outside compartments. When sorting is completed, the inspector tilts the table top to allow the tomatoes to fall directly into containers resting on scales. Finally, he records the weights and computes percentages of each separation, which he also records on the inspection memorandum.

on the inspection table, examines each specimen, and places it in its proper grade compartment (fig. 6). When he completes the sorting of samples, he records on the inspection memorandum the weights of the specimens in each compartment. By use of the slide rule or a computation chart he then calculates the percentage of each grade by weight in the sample and records it. A signed copy of the memorandum is handed to the grower or trucker, another is retained for the applicant, and a third one is retained by the inspector (fig. 7). Final settlement for the load is based on the percentages of each grade shown on the memorandum.

UNITED STATES DEPARTMENT OF AGRICULTURE
 Form FDA 27
 (Superseding FPI 38) **INSPECTION MEMORANDUM A- 37350**

This memorandum is issued pursuant to the act making appropriation for the United States Department of Agriculture and is receivable as prima facie evidence in all courts of the United States. This memorandum does not excuse failure to comply with any of the regulatory acts enforced by the United States Department of Agriculture or Federal Food and Drug Administration.

Inspection point Hanover, Pa. Date Sept. 8, 1945 Hour 3:30 P.M.
 Canner John Dye Canning Co. Grower Frank Smith
 Products inspected Tomatoes Number of containers 210
 (Grower's count)

I, the undersigned, on the date above specified, made personal inspection of samples of the lot herein described, and do hereby certify that the conditions at the said time and on the said date as shown by said samples were as stated herein.	Grade	Pounds	Percent
	U S No 1	91	69
	U S No 2	39	30
	Culls	1	1
	Total	131	100

The information below is for the convenience of the canner and its accuracy is not vouched for by the above inspector

Gross weight - - - - -	lbs. U S No 1 @ \$	\$
Tare - - - - -	lbs. U. S. No 2 @ \$	\$
Net - - - - -	lbs. Culls	
Value of total load, \$		

Figure 7.—This type of inspection memorandum, showing the percentage of each grade and culls in growers' loads, is issued on products for processing.

Inspection of raw products for processing on the basis of U. S. standards has been increasing for a number of years. The system of having an unbiased Federal-State inspector determine the percentage of the various grades in delivered loads is pleasing to both processors and growers. Under it, the grower has the incentive to deliver the best quality of produce possible, because the higher the quality the better are his returns. Naturally, under such a system, the canner receives better quality raw products from which to manufacture higher quality finished products. The system has also done away with countless numbers of heated arguments between growers and processors over settlement for products delivered.

Federal Inspection at Receiving Markets

Inspection of fresh fruits and vegetables at receiving markets is conducted under Federal supervision only, whereas, inspection at shipping points is done under Federal-State supervision. As will be recalled, this service, inaugurated in 1918, was established 4 years before Congress provided for inspection at shipping points, for the purpose of enabling shippers to ascertain the condition of produce upon arrival in the markets. The service was later extended to receivers and other financially interested parties.

Inspectors are employed under Civil Service regulations, except when war emergency conditions arise. They must have a certain amount of training or experience in related work to qualify for the position, and pass a competitive examination successfully before entrance into the service. New inspectors are usually given several weeks of intensive training in Chicago or New York, or in one of the other large market centers. During this period market pathologists of the Bureau of Plant Industry, Soils, and Agricultural Engineering assist in the training by giving a course of instruction in the symptoms, significance, and identification of the principal market diseases. To aid trainees in learning this phase of the work, specimens of fresh fruits and vegetables affected by various types of decays and defects are brought in from time to time from the cars where they were inspected, so that by the end of the training period the men have become proficient in the identification of the most important diseases and defects.

Assistance by market pathologists, however, does not end at training schools. Their services are available at all times as consultants in Chicago, New York, and Washington, and supervisors and inspectors at shipping points and in the markets are continually sending the consultants specimens of various fruits and vegetables affected by diseases for identification and study. Proper identification of diseases in lots of fresh fruits and vegetables inspected has great significance in connection with the settlement of controversies between shippers and receivers and claims against transportation companies. Equitable settlement of the arrival condition of a shipment frequently hinges on the question of whether the diseases found were present at shipping point or developed in transit. Thus, it is very necessary that inspectors keep abreast of the times in this important phase of standardization and inspection.

Training also includes instruction in the requirements of standards and in inspection technique. In addition to classroom work in these subjects, trainees are assigned to assist experienced inspectors with actual inspections in the cars and in cold storages. These experienced inspectors instruct the trainee in all phases of the work including opening of the car, taking samples, scoring of defects, entering the findings on the note sheet, and proper wording of the information to be shown on the inspection certificate.

The trainee often is given the responsibility of interpreting the notes and reporting the facts to be shown on the certificate. His work is carefully checked by experienced inspectors and supervisors and through constructive criticism he learns inspection procedure quickly and gains confidence in himself. Examinations are given each week to indicate the trainee's ability as an inspector. Such intensive training is usually continued for a period of 6 weeks or 2 months.

Upon completion of the course, the new men are generally assigned to one of the larger offices where they continue to work for some time with experienced inspectors. Practically all of the Federal inspectors now serving in one of the 54 offices located in the larger cities throughout the country began their careers in either the New York or Chicago inspection offices. The Federal supervisors of shipping-point inspection in most of the States received their training in the markets as receiving market inspectors.

Inspection at receiving markets is not only available in the markets where inspection offices are located but in any other city or town, provided the applicant is willing to pay the costs of transportation and other expenses of an inspector to and from one of these offices. Such offices, of course, cannot be maintained in all cities and towns of the country, because the volume of business would not justify the cost. At present, receiving market inspection offices are maintained in the following cities:

Albany, N. Y.
Alexandria, La.

Atlanta, Ga.
Augusta, Maine

Baltimore, Md.
Baton Rouge, La.

Boston, Mass.	Jacksonville, Fla.	Pittsburgh, Pa.
Buffalo, N. Y.	Jackson, Miss.	Portland, Oreg.
Chicago, Ill.	Kansas City, Mo.	Raleigh, N. C.
Cincinnati, Ohio	Los Angeles, Calif.	Richmond, Va.
Cleveland, Ohio	Memphis, Tenn.	Rochester, N. Y.
Columbia, S. C.	Miami, Fla.	Sacramento, Calif.
Columbus, Ohio	Milwaukee, Wis.	St. Louis, Mo.
Denver, Colo.	Minneapolis, Minn.	Salt Lake City, Utah
Detroit, Mich.	Montgomery, Ala.	San Diego, Calif.
Duluth, Minn.	Newark, N. J.	San Francisco, Calif.
Fargo, N. Dak.	New Orleans, La.	Seattle, Wash.
Fort Worth, Tex.	New York, N. Y.	Shreveport, La.
Harrisburg, Pa.	Norfolk, Va.	Tampa, Fla.
Hartford, Conn.	Oklahoma City, Okla.	Trenton, N. J.
Houston, Tex.	Philadelphia, Pa.	Washington, D. C.
Indianapolis, Ind.	Phoenix, Ariz.	Winter Haven, Fla.

A large percentage of the requests for inspections at receiving markets are for cars of produce which are believed by the receivers to have changed in condition during the transit period. Thus, the receiver may request inspection for condition only. He wants the official inspection report for the purpose of showing what percentage of the stock has deteriorated and to what extent.

The information on the report may be used in making final settlement with the shipper and for the purpose of aiding in fixing responsibility for the deterioration. Possibly high car temperatures and lack of ice in bunkers may indicate that the railroad company was negligent in handling the car. Again, the inspector may name the specific disease which causes the decay. The damage might have been caused by a field disease which did not develop until after the car was rolled. In such a case, the damage would be the shipper's responsibility because the product was not in suitable shipping condition. The inspection certificate is of material aid in helping to fix responsibility for damage and to determine who shall stand the losses, if any.

Often the receiver may question the grade of a car of produce which was inspected and certified as of a certain grade at shipping point. Therefore, he might request an appeal inspection. For such requests, usually two inspectors are assigned to make the appeal inspection, in which case they would examine at least twice the regulation number of samples. No charge for the inspection is made to the applicant if it is found that the shipping-point inspection was in error and the report is reversed. However, a double charge for an appeal inspection is levied if the original inspection is sustained.

Inspection procedure in receiving markets is similar to that employed by inspectors at shipping points. The Federal inspector selects representative samples from various parts of the car or lot, analyzes them in accordance with requirements of the standards, and reports the facts on the inspection certificate (fig. 8). Often in a car inspection it is necessary to restrict the inspection to the accessible portion of the load, such as the two upper layers or even between doorways if the car is heavily loaded or top-iced. It is the applicant's responsibility to make loads accessible for unrestricted inspection and often it is necessary for him to furnish helpers and a truck to make the load accessible for inspection.

The receiving-market inspection certificate differs from the shipping-point certificate in that separate headings are provided for the quality and condition statements. On the shipping-point certificate these headings are combined. The quality statement, of course, pertains to permanent factors of grade which do not change in transit. Defects of a progressive nature, such as decay, freezing injury, wilting, and other factors which are subject to change during the transit period, are reported under the condition heading.



Figure 8.—Federal inspectors make a destination inspection of a car of onions in an eastern market.

Receiving-market inspection is by no means confined to inspection for carlot shippers and receivers only. Receiving-market inspectors also inspect supplies, mostly on the basis of U. S. standards, for many Government and private agencies, such as the Navy, Quartermaster Market Center, Marine Corps, Coast Guard, Veterans' Administration facilities, and steamship lines operating under the War Shipping Administration and various city and county institutions. During the fiscal year 1946, the inspections for Government and private agencies totaled 77,880 carlot equivalents; whereas, 35,648 carloads of produce for shippers and receivers were inspected.

Inspection of Government purchases is important from the standpoint of ascertaining whether dealers deliver the quality of produce called for in contract specifications. Without such inspection, the Government would, no doubt, be the dumping ground for a large portion of the low-quality fruits and vegetables which reach the markets.

SERVICE UNDER THE PERISHABLE AGRICULTURAL COMMODITIES ACT

A discussion of standardization and inspection of fresh fruits and vegetables would not be complete without mentioning the service rendered by the Fruit and Vegetable Branch in enforcing the provisions of the Perishable Agricultural Commodities Act. This law, familiarly known to the produce trade as the PAC Act or the PACA, was passed by Congress in June 1930 for the purpose of preventing unfair and fraudulent practices in the marketing of fresh fruits and vegetables in interstate or foreign commerce and to provide relief for those who suffer from

such practices. Under the provisions of the act, all dealers, commission merchants, and brokers who handle fresh or frozen fruits or vegetables which move interstate or from foreign countries are required to have a license in order to operate. The license fee is \$10 per annum. The penalty for operating without a license is fixed at not more than \$500 for each such offense plus \$25 per day for each day the offense continues.

Some of the practices prohibited under the act are:

1. Failure to account promptly and correctly and to pay in full for produce received on consignment.
2. Failure to pay promptly the agreed purchase price of produce which complies with the contract terms.
3. Rejection without reasonable cause of produce purchased or contracted to be handled on consignment.
4. Making of any false or misleading statement, for a fraudulent purpose, in connection with any transaction.
5. Failure to keep an adequate and correct set of records of the receipt and sale of produce.
6. Failure of a seller, without reasonable cause, to deliver produce sold or contracted to be sold or consigned.
7. Failure to pay earned brokerage or commission fees, and deficits sustained by commission merchants on produce handled on consignment.
8. Failure without reasonable cause to perform any specification or duty, express or implied, arising out of any transaction.
9. Misrepresentation (misbranding), by stamp, stencil, or label, of the kind, grade, quality, quantity, or State or country of origin of the commodity.
10. Removing or changing in any way any card or tag, placed upon any container or railroad car under Federal or State authority, that bears a statement as to the grade, quality, or State of origin of the commodity contained therein.
11. Changing or permitting the changing, without the consent of the inspector, of the contents of a load or lot of produce after it has been officially inspected.

It is true that the PAC Act is regulatory. However, in administering it, the Fruit and Vegetable Branch regards it as a service to the fruit and vegetable industry. It provides relief against unfair trade practices, and under it the Department will furnish assistance to anyone financially interested in a transaction covered by the law, including unlicensed growers or shippers. When one of the contractors requests, it will, without charge, promptly communicate with the other party to the contract, make such investigations as may be necessary, and endeavor to bring about an amicable informal adjustment of disputes. If necessary, it will take formal action, give each party to a contract a chance to present his case fully, and determine the loss or amount of damages to be paid. If a violation is found to warrant such action, the Department will publish the facts and/or suspend or revoke the offender's license.

Evidence of the extent of service rendered to the industry from the Washington office of the Department and the four branch offices located in New York City, Chicago, Los Angeles, and Portland, Oreg., is obtained from the fact that 2,019 complaints were handled during the fiscal year 1946. Of these complaints, 553 were personally investigated. By the end of the year, 987 cases were closed, leaving 546 cases pending. The astounding fact is that 916 cases were amicably settled during the year with settlements amounting to more than a million dollars. Seventy-six formal orders were issued, which awarded reparations totaling about \$89,000. Although the act was not designed as a revenue-producing measure, fees received for licenses have exceeded the cost of administration by about \$40,000 per year since inception of the act.

It is obvious that such service to the fruit and vegetable industry could not be given under the act without grades and standards and inspection. Contracts between shippers and receivers ordinarily specify a certain grade of a product and the information given on shipping-point and receiving-market inspection certificates usually furnish the evidence necessary for final settlement of disputes. The importance of the inspection service as an aid in enforcing the PAC Act is further emphasized by the fact that section 14 of the act includes authority for making inspections.

HAS THE CONSUMER BENEFITED?

From the foregoing brief description of the services available to the industry under the fresh fruit and vegetable grading and inspection programs, one might gain the impression that they have benefited only growers, shippers, and dealers in the markets. The question, therefore, might properly be asked: Has the consumer benefited under such programs? The answer is Yes. Because of the programs, the consumer is able to buy a better quality of fruits and vegetables. There is no doubt that the general quality of fresh fruits and vegetables offered for sale in retail stores is superior to the quality offered before products were packed in accordance with requirements of official grades. And so it can be said that even though most products lose their wholesale grade designation before they reach the consumer, he has definitely benefited by being able to buy better quality produce.

One reason why consumer or retail grades have not been developed for perishable produce is because it has been thought that under past methods of distribution the sale of such produce by grades was not practicable, since the condition of some products changes so rapidly. For example, such products as tomatoes, peaches, and all kinds of berries might meet the requirements of a certain grade when put on display for sale in a store in the morning, but they often would be far off-grade by late afternoon owing to the development of decay during the day. Such however, would not be so true of apples, citrus fruits, onions, cabbage, potatoes, and other such less perishable products.

Recently, numerous requests from consumer groups, retail organizations, and even some shippers have been received by the Department of Agriculture for U. S. consumer or retail standards for fresh fruits and vegetables. Postwar developments point to many changes and improvements in the merchandising of fresh fruits and vegetables. Railroad companies promise better refrigeration and quicker transportation. Airplane transportation of certain products is already being tried. Some retail organizations contemplate the construction of refrigerated storage and sales display cabinets. Package manufacturers and retailers are cooperating in experimenting with many different types of consumer packages for many products to replace the familiar brown paper bag container. Already some products are available in retail stores in specially packed consumer packages.

Tomatoes, for instance, are being packed by carlot receivers in small paper cartons holding from 3 to 6 tomatoes and so packed are receiving widespread acceptance by consumers. Fresh spinach, washed, trimmed and "ready for the pot," is being packaged in small cellophane bags in some of the larger cities for quick distribution through retail outlets. Consumers are already familiar with the small cloth and paper bags of potatoes, onions, and citrus fruits which have been available in the stores for several years.

With such changes in our methods of distribution, merchandising, packaging, refrigeration, and transportation in the offing, it appears that the sale of produce packed to meet requirements of official consumer or retail standards may become feasible for some products at least. To carry out such a program on a large scale

would probably mean that wholesale carlot receivers or other dealers would have to set up reconditioning and packing equipment for packaging fruits and vegetables for distribution to the stores. Produce as it is received from the cars is generally not of a quality satisfactory to consumers. Decayed or otherwise badly defective or damaged specimens would have to be sorted out in order to meet consumer acceptance and the requirements of any official standards that might be issued. Possibly some products might be packed in consumer packages at shipping points, particularly if they were transported by airplane or for short distances by fast freight or express.

Obviously, if produce is to be packed in consumer-sized packages in accordance with official consumer standards, the packages would have to be marked with the grade designation and date of packing in order to have any significance to the consumer. After a certain period of time has elapsed after packing, any product will deteriorate to the point where it will not meet the requirements of any established grade. Retailers would have to give more attention to fruits and vegetables in reconditioning packages labeled as to grade, and either replace those which have deteriorated or remove or strike out the grade markings on the package.

Consumers, on the other hand, should not expect to find all of the contents perfect just because the package carries a Grade A label, because in the many handlings from the grower to the retail store some produce is bound to be injured. Some of it may show slight imperfections owing to climatic and cultural conditions which do not materially affect the product for home use. A consumer, however, should not be expected to accept more than a very small percentage of decayed or badly damaged fruits and vegetables in packages bearing an official grade designation. Success or failure in selling produce to consumers in small packages marked as to grade will depend largely upon the extent to which the products actually meet the requirements of the grades as labeled at the time of purchase.

